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EXAMINER

ZERVIGON, RUDY

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 09/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

09/942,330

Applicant(s)

WILLIAMS ET AL.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 21-26 is/are pending in the application.
- 4a) Of the above claim(s) 25 and 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 21-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Election/Restriction***

1. Newly submitted claims 25 and 26 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The apparatus as claimed can be used to practice another and materially different process, for example, deposition gas abatement. See restriction in prior action.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 25 and 26 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Claim Rejections - 35 USC § 102***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 2, 8, 10, 22, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Alan Notman (USPat. 4,311,671). Alan Notman teaches a catalytic gas reactor (Figure 1; column 6, line 59 – column 7, line 31) including:

- i. An enclosure (10) which defines an interior void (Figure 1) and a longitudinal axis down the center of item 42
- ii. A first partition (16A; column 6, lines 59-68) having a first orifice (“central hole”; column 2, lines 1-15; column 7, lines 3-7) defined therein, the first partition being positioned within the interior void such that:

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- a. The first partition divides the interior void into a first chamber (12A) and a second chamber (12B) and
  - b. The first orifice is in fluid communication with the first chamber and the second chamber (Figure 1; column 7, lines 3-7)
- iii. A gas connector (conduit 34) which has:
  - a. A passageway (34) defined there through and
  - b. A gas port (30) in fluid communication with the passageway and supplied by a gas source (see arrow entering 30; column 7, lines 1-10), the passageway having an inlet (34) and an outlet (32) and being in direct fluid communication with the first chamber (12A) of the enclosure
  - c. The gas source is advanced into the passageway (34) of the gas connector (conduit 34) via conduit 26
  - d. The gas port (30) being downstream of the gas connector inlet (34) and upstream of the gas connector outlet (32) – The Examiner’s “downstream” interpretation is the direction that is the same as the gas flow direction through the gas connector. And so the gas port is further down along the direction of the gas flow of the gas connector inlet. The Examiner’s “upstream” interpretation is the direction that is counter to the gas flow direction through the gas connector. And so the gas port is further up counter to the direction of the gas flow of the gas connector outlet.
- iv. A gas dispenser (28A/B) in direct fluid communication with the second chamber (12B) of the enclosure; and
- v. An exit port (50) in fluid communication with the interior

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- vi. A second partition (16B) having a second orifice (holes in 16B, not labeled, see crossing arrows indicating flow) therein wherein
  - a. The second partition is positioned within the second chamber (12B)
  - b. The first orifice has a first central axis (collinear to central axis of 42) and being aligned (colinear) with the longitudinal axis of the enclosure, the first central axis is further unobstructed such that gas can pass (see flow arrows) from the first chamber to the second chamber through the first central axis
  - c. The second orifice (holes in 16B other than 42, not labeled, see crossing arrows indicating flow) has a second central axis and the second central axis of the second orifice is offset (see Figure 1) relative to the first central axis of the first orifice

Alan Notman further teaches water vapor gas source ("boiler"; column 6, lines 32-35; column 4, lines 55-60; Table 1 - column 10, lines 40-60). Further, it is well established that in apparatus claims it is inherent that Alan Notman's gas processing apparatus can process water vapor gas. It is well established that apparatus claims must be structurally distinguished from the prior art (In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does ." (emphasis in original) Hewlett - Packard Co . v. Bausch & Lomb Inc ., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990), MPEP – 2114)

***Claim Rejections - 35 USC § 103***

- 4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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5. Claims 3-6, 21, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alan Notman (USPat. 4,311,671). Alan Notman is discussed above. Alan Notman further teaches points on Alan Notman's partitions (16A,B,C) that are collinear with the chamber's longitudinal axis (Figure 1). Alan Notman further teaches adjacent partitions (16A/B; 16B/C) such that each partition forms corresponding sub-chambers by interposing the corresponding partitions (Figure 1). Alan Notman further teaches partition orifice that are in direct fluid communication (see arrows in Figure 1) with the first chamber and the corresponding sub-chamber. Alan Notman further teaches an end wall (22c, Figure 1).

Alan Notman further teaches plural orifice (holes in 16A,B,C; not labeled, see crossing arrows indicating flow) with corresponding central axis where each orifice's central axis is offset relative to the central axis of each other orifice. Alan Notman further teaches a longitudinal axis, as above, that divides the enclosure into a first and second half (Figure 1) where orifice of each partition are either located in the first or second half of the partition.

Alan Notman does not teach partitions, in Figure 1, beyond 3. As a result, Alan Notman does not teach fourth, fifth, and sixth partitions resulting in corresponding fourth, fifth, and sixth sub-chambers.

Alan Notman does not teach that his first and second orifice comprise the largest orifice in his first and second partitions respectively such that the central axis of the first and second orifice are offset relative to each other.

Alan Notman does not teach his gas port disposed between the inlet and outlet of his passageway.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to duplicate Alan Notman's partitions thereby adding additional partitions to Alan Notman's catalytic gas reactor resulting in corresponding fourth, fifth, and sixth sub-chambers, and to optimize the dimension of Notman's orifice in each of the first and second partitions such that the largest orifice of each partition produce axis that are offset relative to each other, and to optimize the dimension (height) of Notman's gas connector passageway such that his gas port disposed between the inlet and outlet of his passageway.

Motivation to duplicate Alan Notman's partitions thereby adding additional partitions to Alan Notman's catalytic gas reactor resulting in corresponding fourth, fifth, and sixth sub-chambers, and to optimize the dimension of Notman's orifice in each of the first and second partitions such that the largest orifice of each partition produce axis that are offset relative to each other, and to optimize the dimension (height) of Notman's gas connector passageway such that his gas port disposed between the inlet and outlet of his passageway is to provide for longer residence time for the flowing gasses (column 3, lines 7-8; column 4, lines 12-17). Further, it is well established that the duplication of parts is obvious (In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04). Further, OPTIMIZATION OF SIZES...

6. Claims 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mundt (USPat. 5,137,701) in view of Alan Notman (USPat. 4,311,671). Mundt teaches an etch apparatus (12, Figure 1; column 1, lines 22-34) which generates an etch gas product (down stream of item 12), where the etch gas apparatus being in fluid communication with an enclosure (Figure 3) defining the process effluent abatement arrangement (18, 32, 16, 20, 36; Figure 1; column 5, lines 13-38).

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Alan Notman is discussed above. However, Alan Notman does not teach an etch apparatus which generates an etch gas product, where the etch gas apparatus being in fluid communication with the gas connector such that the etch gas product generated by the etch apparatus is advanced into the interior void of the enclosure defining the process effluent abatement arrangement.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Mundt's process effluent abatement arrangement with Alan Notman's catalytic gas reactor to process the effluent from Mundt's etch apparatus.

Motivation to replace Mundt's process effluent abatement arrangement with Alan Notman's catalytic gas reactor to process the effluent from Mundt's etch apparatus is to reduce the hazardous process chemicals from the etch reactor as taught by Mundt (column 1, lines 22-33).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alan Notman (USPat. 4,311,671) in view of Thomas G. McGinness. (USPat. 5,384,051). Alan Notman is discussed above. Alan Notman further teaches heating elements (60,62) as heat exchangers that are in thermal communication with the gas provided by the gas source at exchanger 62. As a result, Alan Notman does not teach an electrical heating element that is in thermal communication with the gas provided by the gas source. Thomas G. McGinness teaches an electrical heating element (32, Figure 1; column 8, lines 55-62) that is in thermal communication with the gas ("carrier fluid/oxidizer mixture") provided by the gas source.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Alan Notman's heating element with McGinness' electrical heating element.



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Motivation to replace Alan Notman's heating element with McGinness' electrical heating element is to provide an alternate and equivalent means for heating.

8. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mundt (USPat. 5,137,701) in view of Alan Notman (USPat. 4,311,671) and Thomas G. McGinness. (USPat. 5,384,051). Alan Notman and Mundt are discussed above. Alan Notman further teaches heating elements (60,62) as heat exchangers that are in thermal communication with the gas provided by the gas source at exchanger 62. As a result, Alan Notman does not teach an electrical heating element that is in thermal communication with the gas provided by the gas source. Thomas G. McGinness teaches an electrical heating element (32, Figure 1; column 8, lines 55-62) that is in thermal communication with the gas ("carrier fluid/oxidizer mixture") provided by the gas source.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add McGinness' heating element to be in thermal communication with the gas provided by the gas source of Alan Notman and Mundt, and to replace Mundt's process effluent abatement arrangement with Alan Notman's catalytic gas reactor to process the effluent from Mundt's etch apparatus.

Motivation to add McGinness' heating element to be in thermal communication with the gas provided by the gas source of Alan Notman is to control the temperature of the gas provided by the gas source of Alan Notman and Mundt.

Motivation to replace Mundt's process effluent abatement arrangement with Alan Notman's catalytic gas reactor to process the effluent from Mundt's etch apparatus is to reduce the hazardous process chemicals from the etch reactor as taught by Mundt (column 1, lines 22-33).

***Response to Arguments***

9. Applicant's arguments filed June 16, 2003 have been fully considered but they are not persuasive.

10. Applicant states that Notman does not teach that Notman's gas port (30) is not disposed upstream of the "feed holes", and that Notman's gas port is not "disposed in the passageway between the main feed 34 and and the feed holes 32. Rather the spargers 30 are disposed downstream of the feed holes 32." The Examiner disagrees. Firstly, Applicant does not claim or make reference to "feed holes" when making a point of reference to being upstream or downstream therefrom. Applicant only claims a "gas connector outlet" when making a point of reference to being upstream or downstream therefrom. As stated above, the Examiner affirms Notman's teaching of:

Notman's gas port (30) being downstream of the gas connector inlet (34) and upstream of the gas connector outlet (32) – The Examiner's "downstream" interpretation is the direction that is the same as the gas flow direction through the gas connector. And so the gas port is further down along the direction of the gas flow of the gas connector inlet. The Examiner's "upstream" interpretation is the direction that is counter to the gas flow direction through the gas connector. And so the gas port is further up counter to the direction of the gas flow of the gas connector outlet.

11. In response to applicant's argument that there is no suggestion to combine the references of Mundt and Notman, and Notman and McGinness, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the

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claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the references provide teaching, suggestion, and motivation, as described above to combine the references themselves. For example, motivation to replace Mundt's process effluent abatement arrangement with Alan Notman's catalytic gas reactor to process the effluent from Mundt's etch apparatus is to reduce the hazardous process chemicals from the etch reactor as taught by Mundt (column 1, lines 22-33).

12. Applicant states that "the main purpose of the heat exchanger 62 of Notman is to cool the reacted hot gas leaving the reactor 50 so that the gas can be separated into methanol and ammonia in the catchpot 70." However, the Examiner's rejection does not alter Notman's heat exchange system 60,62 in any form including Applicant's proposed "substitution". Specifically, the Examiner stated that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to add McGinness' heating element to be in thermal communication with the gas provided by the gas source of Alan Notman and Mundt...". The motivation for the addition being "to control the temperature of the gas provided by the gas source of Alan Notman and Mundt" which Notman clearly demonstrates according to his heat exchange equipment 60 and 62.

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***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.



**JEFFRIE R. LUND  
PRIMARY EXAMINER**